

Lecture 1


DEFINITION: “invest” - invests/advise/trades servicing individuals, corporations and governments -

Chapter I – The Origins of Investment Banking

- Commercial Banking vs. Investment Banking
 - Retail banking / Taking Deposits
 - Issuing Securities / Distribution

- Italy (Venice) 14th c Renaissance Era – Invention of modern Banking
 - Medici Bank – Giovanni de’ Medici – Fx Dealers (Bakers (Bancieri) - “Bills of Exchange” – at a discount

Holland	Switzerland	England
Exchange Bank standard currency – no coin exchange – (Debt/Credit) – 100% Reserve	Creation of LADA bank (Lending) – Taking Deposits and Lending out with smaller reserve	Creation of Bank of England = (1694) Bank Notes - converting Government to stock – “Cash is King”

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- France (Napoeleonic Era)-
 - **Merchant Banker (Modern Investmetn Banking)**, Deposits vs. Investments, offering credit to the clients (commercial bills)
 - Modern Investment Banking in France (Soc Gen, Credit Lyonnais)

 - Germany
 - DB, Commerz Bank, Dresdner Bank, 1948 True Investment Banking, Transaction Banking Business of all kinds plus promote and facilitate trade relationships. Biggest customer-Siemens (industrial)

 - U.S. – BANKING WAS CREATED TO SERVE THE NEEDS OF THE INDUSTRIAL REVOLUTION (RAILROAD, MINING)
 - 1863 National Banking Act, National Bank vs. Private Banking (Kidder Peabody Brokerage) Investments in Railroads, Insurance
 - New York Firms Specialize in Railroad Financing – Distributed Bonds and Pay Interest, Railroad Firms were highly leveraged

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Advise Customers

- “Morganization” – the bank would take several steps to improve their financial position and assist the degree of control
- JP Morgan – During the panic of 1893, President Cleveland appealed to Morgan for help. Morgan backed \$62M of Gold Bond to support the U.S. Gold Standard and thus prevent a financial collapse of the U.S. Dollar
- Goldman Sachs – **Marcus Goldman** arrived from Germany in 1848 and founded Marcus Goldman & Co. – broker of “IOU’s” in New York; 1882 it became Goldman Sachs
- Lehman Brothers – Co-underwriter of equity issues (IPO’s). First IPO was Sears Roebuck, 1906 – a chain department store that was founded in 1893. **Henry Lehman**, an immigrant from Germany opens a small shop (commodity business) in Montgomery, Alabama in 1844. The stock market crash in 1929 placed tremendous pressure on the availability of capital. Lehman innovated financial techniques through private placements.
- Lazard Freres – started in a dry goods business in New Orleans, 1848 and moved to San Francisco for the Gold Rush
- Merrill Lynch – Charles Merrill 1914 established a brokerage firm and investment house and purchased control of Safeway Grocery stores in 1926 – a bad timing before the depression of 1929. **His idea was to sell securities to average Americans.** He would lend money to them to purchase the stock which today is considered a conflict.
- October 24, 1929 – Black Thursday run on the banks.
- 1930-1933 – 10,000 banks failed – which affected a lot of loans in Europe and impacted Germany specifically – that was the beginning of Hitler taking office in 1933 that nationalized all the banks in Germany
- Consequences of the Crash. President Roosevelt introduced three important acts:
 - The Securities Act of 1933 (Primary market)
 - Banking Act of 1933 (Glass-Steagel Act)
 - Securities & Exchange Act (Securitization)

**MILESTONE #1
DEPRESSION
CHANGE
BANKING**

Surging demand for capital

Lance Davis has demonstrated that the process of capital formation in the nineteenth century was markedly different between the British capital

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market and the American capital market. British industrialists were readily able to satisfy their need for capital by tapping a vast source of international capital through British banks such as Westminster's, Lloyds and Barclays. In contrast, the dramatic growth of the United States created capital requirements that far outstripped the limited capital resources of American banks. Investment banking in the United States emerged to serve the expansion of railroads, mining companies, and heavy industry. Unlike commercial banks, investment banks were not authorized to issue notes or accept deposits. Instead, they served as brokers or intermediaries, bringing together investors with capital and the firms that needed that capital

- Banking Act of 1933
 - Glass-Steagall Act of 1933
 - Forced the banks to choose between commercial banks & investment banks. JP Morgan chose commercial banks. People from JP Morgan left the firm to form Morgan Stanley and called themselves investment banks.
 - Banks cannot lend more than 15% of the capital to single borrowers (Japan 30% and Germany is 50%)

- Securities Act of 1933

Congress enacted the [Securities Act of 1933](#) in the aftermath of the [stock market crash of 1929](#) and during the ensuing [Great Depression](#). Legislated pursuant to the interstate commerce clause of the Constitution, it requires that any offer or sale of securities using the means and instrumentalities of interstate commerce be registered pursuant to the 1933 Act, unless an exemption from registration exists under the law.

The 1933 Act was the first major federal legislation to regulate the offer and sale of securities. Prior to the Act, regulation of securities was chiefly governed by state laws, commonly referred to as [blue sky laws](#). When Congress enacted the 1933 Act, it left in place a patchwork of existing state securities laws to supplement federal laws in part because there were questions as to the constitutionality of federal legislation

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- The Bank Holding Act of 1956 – any national bank association or any state bank, savings bank and trust bank. Bank means accepting deposits and making commercial loans. The interest differential is called Arbitrage. As the Arbitrage narrowed, the banks got into the fee based business. These banks were allowed to invest outside the U.S. to make money – that was a development of the Euro Dollar Market.

- Notable Dates
 - 1981 – Solomon Brothers sold itself to Phibro Company
 - 1981 – Dean Witter sold itself to Sears
 - 1984 – Lehman Brothers was bought by Shearson American Express
 - 1986 - Kidder Peabody acquired by GE
 - 1987 – Solomon Brothers merged with Smith Barney
 - 1994 – Lehman Brothers spun off from American Express
 - 1995 – Paine Webber acquired Kidder Peabody from GE

- Many state independent by relying on the equity markets
 - Bear Stearns – IPO 1985
 - Morgan Stanley – IPO 1986
 - Goldman Sachs – IPO 1999, 25% of the capital was provided by Sumitomo in 1986

**MILESTONE #2
CITI BUYING
TRAVELERS**

- Banking Act has successfully eliminated competition for investment banks – 1999 the Gramm Leach and Bliley Act or the Financial Services Modernization (Citibank Relief Act)

- Universal banks
 - 1998 – Merger of Travellers with Citibank
 - 2001 – JP Morgan with Chase Manhattan
 - 2003 – Wachovia with Prudential Finance

- European banks
 - 1997 – UBS merged with Warburg Pincus
 - 1998 – Credit Suisse merged with First Boston
 - 1999 – Deutsche Bank merged with Bankers Trust

**MILESTONE #3
CITI BUYING
TRAVELERS**

Volker Rule / Dott-Frank (2000 pages)

2008 Financial Crisis

The 2007 credit crisis proved that the [business model](#) of the investment bank no longer worked^[47] without the regulation imposed on it by Glass-Steagall. Once [Robert Rubin](#), a former co-chairman of [Goldman Sachs](#) became part of the [Clinton](#) administration and deregulated banks, the previous conservatism of underwriting established companies and seeking long-term gains was replaced by lower standards and short-term profit.

Formerly, the guidelines said that in order to take a company public, it had to be in business for a minimum of five years and it had to show profitability for three consecutive years. After deregulation, those standards were gone, but small investors did not grasp the full impact of the change.

Investment banks [Bear Stearns](#), founded in 1923 and [Lehman Brothers](#), over 100 years old, collapsed; [Merrill Lynch](#) was acquired by Bank of America, which remained in trouble, as did [Goldman Sachs](#) and [Morgan Stanley](#). The ensuing [financial crisis of 2008](#) saw [Goldman Sachs](#) and [Morgan Stanley](#) "abandon their status as investment banks" by converting themselves into "traditional bank holding companies", thereby making themselves eligible^[47] to receive billions of dollars each in emergency taxpayer-funded assistance. By making this change, referred to as a technicality, banks would be more tightly regulated. Initially, banks received part of a \$700 billion [Troubled Asset Relief Program](#) (TARP) intended to stabilize the economy and thaw the frozen credit markets. Eventually, taxpayer assistance to banks reached nearly \$13 trillion dollars, most without much scrutiny, lending did not increase and credit markets remained frozen.

A number of former Goldman-Sachs top executives, such as [Henry Paulson](#) and [Ed Liddy](#) moved to high-level positions in government and oversaw the controversial taxpayer-funded [bank bailout](#). The TARP Oversight Report released by the [Congressional Oversight Panel](#) found, however, that the bailout tended to encourage risky behavior and "corrupt[ed] the fundamental tenets of a [market economy](#)".

“ The TARP has all but created an expectation, if not an emerging sense of entitlement, that certain financial and non-financial institutions are simply “too-big-or-too-interconnected-to-fail” and ”

that the government will promptly honor the implicit guarantee issued for the benefit of any such institution that suffers a reversal of fortune. This is the enduring legacy of the TARP. Unfortunately, by offering a strong safety net funded with unlimited taxpayer resources, the government has encouraged potential recipients of such largess to undertake inappropriately risky behavior secure in the conviction that all profits from their endeavors will inure to their benefit and that large losses will fall to the taxpayers. The placement of a government sanctioned thumb-on-the-scales corrupts the fundamental tenets of a market economy – the ability to prosper and the ability to fail.

—Congressional Oversight Panel, *TARP Oversight Report*

Chapter 2 – History of Key Products

Church influence – paying interest was a blasphemy – innovation for new products:

- T-Bills
 - Short-term securities issued by the U.S. Treasury to finance the national debt
 - Issued at a Discount to FV – i.e – pay \$960 for \$1,000 at expiration - \$40 or 4.0% if one year

- Repurchase Agreement
 - Sale and buyback – lent without interest charges - sell goods and buy back these goods for a higher price (farmer - a flock of sheep)
 - Today – a person sells securities for a price and buys back at a higher price

- Mortgage-Backed Securities
 - Loans secured by Real Estate properties
 - Mortgages became very important in the US to finance Private Homes
 - 1968 – U.S. Congress sponsored the GNMA (Government National Mortgage Assets – Providing liquidity – lenders move

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their mortgages off their balance sheet while retaining the service rights

- Pool of mortgages (ABS: CDO, CMO, CLO)

- Bond Syndication

- Options - insurance on merchandising – delivery in good shape – pay less (certain price) – avoid pirates, etc.

- Cash Is King
 - Invention of Bank Notes and Paper Money replacing coins, issuing Promissory Notes to finance the English Floating Debt Exchange. Today, the 10lb Note says: “I promise to bearer of demand the sum of 10 pounds” and signed by the Chief Cashier
 - Cash is the root from Casu, which means coins

- The Corporation – Structure – Economic Growth – Issue Capital

- Stock Exchanges – Bank Notes – Commodities – Equity

Chapter 3 – Investment Banking

Definition: Investment Bank of Invest, Underwrite, Purchase, Sale or Brokerage of Securities from one account to another

- Commercial Bank is an intermediary between customers who save money and customers who borrow money

- Investment Bank does the following functions:
 1. Raising Capital
 2. Trading Securities
 3. Advising on Corporate Strategies (M&A)
 4. Intermediary between sellers & buyers of securities
 5. Advisors of corporations, government, individuals and institutions

- Investments Bank act in three ways:

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1. Services to clients
 - Advise for solutions
 - Capital markets for insurers
 - Portfolio management for investors
 - Executing transactions for equities, bonds, currencies, options, futures
 - Research reports and information and mergers & acquisitions, valuations

2. Available products
 - Client relationship management
 - Equity Issuance
 - Debt Issuance
 - Derivatives

3. Financial Role
 - Trade on Account
 - Take risk
 - Hedge risk

Chapter 3 - Organizational Structures:

Front Office / Middle Office / Back Office or Banking services

FRONT OFFICE

4. Investment Banking Division (Help companies)
 - Regional
 - Industrial
 - By-Product Group

 - Financial Advisory
 - Mergers & Acquisitions
 - Restructuring

 - Underwriting (Capital Markets)
 - Public & Private Offering

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5. Sales & Trading Divisions

- Trading (buying and selling) in the capital markets (fixed income, currencies, commodities, equity)
- Intermediaries between seller and buyers
- FICC
 - Credit products (bank loans, other debt)
 - Mortgage Backed Securities or ABS
 - Interest Rate Products (derivatives)
 - Currencies (swaps)
 - Commodities (swaps)
- Equity
 - Securities
 - Futures
- Options

6. Research (Financial Analysis)

7. Asset Management & Security Services Division

- Mutual Funds
- Prime Brokerage Product Services (hedge funds)
- Private Wealth Management / Private Client Services

8. Merchant banking (investments)

MIDDLE OFFICE

1. Risk Management

- Market Risk
- Credit Risk
- Operating Risk (Patriot's Act, KYC)

2. Corporate Treasury

- Funding
- Liquidity Risk

3. Financial Control

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4. Planning (portfolio management / trading ideas, asset allocations)

BACK OFFICE

1. Operations
 - Data Check/ trade settlements
 2. IT (Technology)
 3. Compliance
-
- Revenue Mix – 5 Sources of Revenue
 1. Commission
 - Act as an intermediary between seller & buyer
 2. Trading Income
 - Make markets/primary & secondary
 3. Underwriting Fees
 - Underwrite security issues
 4. Interest on Loans
 5. Other fees such as asset management, portfolio, management of funds and advisory fees

CLASSIFICATION

1. Bulge Bracket Firms (Large Caps and Mid caps – MS, GS, Merrill)
2. Tier One
3. Regional Broker (Raymond James)
4. Boutiques (Lazard)

Commercial banks (JPM own Bear Stearns, CS owns BT)

Lecture 2 – RELATIONSHIP MANAGER

Definition: A relationship manager is more than a glorified salesman. She's responsible for establishing a relationship, maintaining it and deepening it. A good relationship manager builds so much customer loyalty that the client always gives her the first shot at any new business--and, all else being close to equal, will ultimately award the new business to her because of that longstanding relationship.

Functions of Relationship manager - Front Office:

- **Corporate Finance** - Raising Capital / Capital markets, primary market
Underwriting / Issuance of Securities
- **Sales and Trading** /Capital Markets, secondary market / market maker / derivatives
- **Advisory Services / Research**

CONCEPTS:

- **Like a Salesman** A relationship manager's primary job is to sell. The difference between a run-of-the-mill salesman and a relationship manager is the length of the sales cycle and the ongoing nature of the relationship. Whereas a salesman looks to meet an immediate need, a relationship manager looks to meet the immediate and long-term needs of a client.
- **Providing Solutions** A relationship manager has to be knowledgeable and present himself as a person who can provide solutions. Anyone can sell a television or a car, but it requires a relationship manager to solve the complex and varied needs of clients who are planning for retirement, trying to manage their wealth or exploring options to sell their business. Due to the long-term nature of his needs, a client must be able to trust that his relationship manager will always be there to take care of him and help him through any changes.
- **Equal Partners:** There are no formal qualifications for a relationship manager. All that is required is the ability to establish trust, a good rapport, and the ability to understand a client's needs and provide solutions. Although no formal qualifications are required, specific industry knowledge or experience is often necessary to successfully understand a client's needs and provide a fully customized solution.

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Personal Characteristics:

1. Intelligence: - Academic / Practical – problem solving
2. Common Sense – Judgment / analyze scenarios
3. Inquisitiveness/ Know the answer to your questions
4. Listening Skills / Pause 1,2,3
5. Problem Solving & Analytical Ability
6. Decisiveness (assign priorities)
7. Results Oriented Nature
8. Self-Motivation
9. Confidence
10. Effective Communication Skills
11. Time Management Skills
12. Attention to Details
13. Ease in Dealing with the Quantitative Aspects
14. Ability to Negotiate
15. Maturity
16. Integrity
17. Adaptability
18. Sense of Humor
19. Tough-Mindedness
20. Student of Human Nature

Technical Skills

1. General Business Understanding
2. Ability to Analyze Financial Statements
3. Economics
4. Grasp of Varying Aspects of Different Industries
5. Understanding Different Source of Financing
6. Understanding Pricing
7. Knowledge of Sources of Information
8. Ability to Apply Legal and Documentation Consideration
9. Product Knowledge, Sales Skills and Customer Contact Exposure
10. Understanding the Bank and its Objectives

Corporate Calls

1. Prospecting Customers
 - a. Existing Customers
 - b. Past Customers
 - c. New Customers

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Corporate Finance Area

➤ Capital Raising

- Develop Financial Strategy and Plan
- Access Capital Markets / Debt Capacity/ Valuation / Pricing
- Analyze, Adjust Achieve

LBOs/ MBOs

Refinancing / Working Capital / Capital Expenditure / Dividend

Raising Debt / Equity

Acquisition Financing

➤ Underwriting / Distribution

- Debt / Equity – Syndication / financial institutions
- Issuance of Securities
- Fees paid / best efforts / Underwriting / Club Deals

Sales & Trading

Will be covered next week

Advisory Services & Research

- Mergers & Acquisitions
- IPO / Debt issuance
- Research – supporting the traders – covered at the next chapter.

See Example – Alexandria Hotel

Lecture 3 – SALES, TRADING & RESEARCH

Sales & Trading

- Buying and Selling securities on behalf of itself and clients.
- Sales component refers to the investment bank's sales force, whose primary job is to call on institutional and high-net-worth investors to suggest trading ideas and take orders.
- Sales desks then communicate their clients' orders to the appropriate trading desks, who can price and execute trades, or structure new products that fit a specific need.
- Structuring has been a relatively recent activity as derivatives have come into play, with highly technical and numerate employees working on creating complex structured products which typically offer much greater margins and returns than underlying cash securities.
- Strategists advise external as well as internal clients on the strategies that can be adopted in various markets.
- This strategy often affects the way the firm will operate in the market, the direction it would like to take in terms of its proprietary and flow positions, the suggestions salespersons give to clients, as well as the way structurers create new products.
- Investment Banks also undertake risk through proprietary trading, done by a special set of traders who do not interface with clients and through "principal risk", risk undertaken by a trader after he buys or sells a product to a client and does not hedge his total exposure.
- Banks seek to maximize profitability for a given amount of risk on their balance sheet. The necessity for numerical ability in sales and trading has created jobs for physics, math and engineering Ph.D.s who act as quantitative analysts.

- **Secondary Yields / Returns** drive the price of new primary issuance
 - Bonds (Sensitive to interest rates / Credit Risk)
 - Equity/IPO (sensitive to valuation methods – see example)
 - Trading levels / comparative analysis

Research

- Sell-side Equity/Bond research analysts typically follow, analyze and advise investors between one and two weeks each month visiting the offices of the buy-side clients to pitch their latest investment ideas.
- Produce equity / bond research reports that include buy/sell recommendations, target prices and earnings forecasts.
- Analysts model and project the financial statements of the companies they cover to determine the fair value of those companies equity securities.

➤ **EFH concept - information**

Random Walks and the Efficient Market Hypothesis

Example - \$100, predicting the stock will go to \$110 in 3 days - if everyone uses the same model, no one is willing to sell – the net effect would be that the stock jumps to \$110.

The theory of movement of the stock is that it moves on new information, which by definition should be unpredictable, therefore the movements of the stock should be unpredictable – this is the essence of the argument that stock prices should follow a **RANDOM WALK** – that is, that price changes should be random and unpredictable.

The notions that all stocks already reflect all available information is referred to as the **EFFICIENT MARKET HYPOTHESIS (EMH)**.

Example: “found a \$20 bill on the ground” story – someone would have picked it up

COMPETITION AS A SOURCE OF EFFICIENCY – models created, gathering information, go to investor’s conferences, read the body language..... Picking a horse on the track – examining the way the horse before it runs – the OTC example (the bum)

“Information is Power” – “behind the hand – 50/50 - Spend money on information – seeking the Alpha

VERSIONS OF THE EFFICIENT MARKET HYPOTHESIS

Weak-form Hypothesis	Semi strong-form Hypothesis	Strong form Hypothesis
<p>Asserts that all information that can be derived by examining market trading data such as the history of past prices, trading volume, or short interest.</p> <p><u>PATTERNS IN STOCK RETURNS</u></p> <ul style="list-style-type: none"> • Returns over a short period of time (patterns in historic data) – correlation to market/movements... momentum effect • Returns over long horizons – cycles, negative / positive news – EXAMPLE (FATHER-IN-LAW, THE ONES IN RECESSIONS) • 	<p>States that all publicly available information regarding the prospects of a firm already must be reflected in the stock price. Company performance, guidance & outlook, management strength...etc.</p> <p><u>MARKET ANOMALIES</u></p> <ul style="list-style-type: none"> • Fundamental Analysis uses a much wider range of information than does technical analysis. Price-Earning/EBITDA Multiple – us the Starwood example. • Use CAPM to adjust for risk (Starwood DCF analysis) and Betas • Small firm premiums (the table I gave you) • Book to Market ratios (Fama & French) • Post earnings announcements 	<p>States that stock prices reflect all information relevant to the firm, even including information available only to company insiders. SEC rules of insiders – Rule 10b-5 Act of 1934 sets limits on trading by corporate officers.</p> <p><u>INSIDE INFORMATION</u></p> <ul style="list-style-type: none"> • A lot of studies were made on insiders trade the stock (buy/sell) – WSJ reports such transactions • SEC requirements – 13D for 5% holdings... Warren Buffet announcements – Burlington Railroad

Efficient Market Hypothesis (EMH) – Implications

- Technical Analysis (patterns in the stocks) –
 - Support Levels / Resistance Levels – example on page 236 (8.2) \$72 and then decline to \$65.... If it begins to climb, the expected resistance level could be at 72 where \$72-holders want to recover their investment.
 - Chartists – study chart for patterns.

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- Fundamental Analysis (Earnings/Dividends/ financial analysis)

Reviewed before (Passive Vs Active Portfolio Management)

ARE MARKETS EFFICIENT?

Few topics:

- Size / magnitude
- Selection Bias Issues (investment scheme – i.e. Leverage) – “Donkey” example
- Dart throwing
- Lucky Event Issue – always read about some investor made a lot of profit (50/50 coin toss , but if 10,000 participate in the coin toss, it won't be surprise that one has a 75%/25% - lucky on the day of the event)
- “Serial Correlation” of stock – lucky streaks
- Looking for behavioral motivations for buying/selling:
 - High Exposure
 - Risk Appetite
 - Tax motivation
 - Resource allocation
- Buy and Hold strategy - despite volatility – upward movement

EXAMPLE – STARWOOD SPREADSHEET

Lecture 4 –Loans, Bonds and Equity

CAPITAL MARKETS / Primary & Secondary

LBO / Acquisitions / Recaps / Refinancing

- Debt Market (Loan /Bond Markets)
- Equity Market
- Derivatives

Debt Markets - Process -Primary

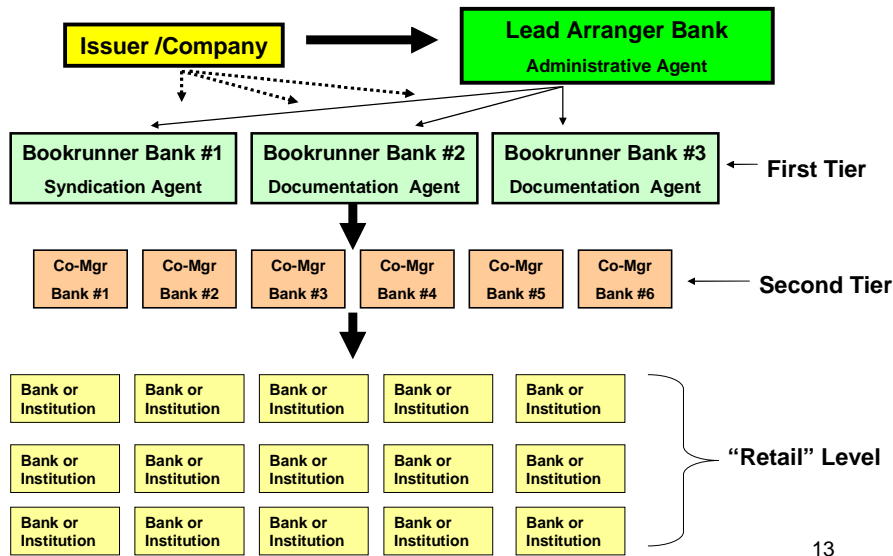
	S&P	Moody's
Risk Free	AAA	Aaa
INVESTMENT GRADE	AA+	Aa1
	AA	Aa2
	AA-	Aa3
	A+	A1
	A	A2
	A-	A3
	BBB+	Baa1
	BBB	Baa2
NON- INVESTMENT GRADE	BBB-	Baa3
	BB+	Ba1
	BB	Ba2
	BB-	Ba3
	B+	B1
DISTRESS	B	B2
	B-	B3
	CCC+	Caa1
	CCC	Caa2
	CCC-	Caa3
Defaulted	CC	Ca
	C	C
	D	C

NOTCHES

Bank Loan Process (Syndications) - Primary



The Loan Syndication Process



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LOAN SYNDICATION PROCESS

- The issuer or Company solicits bids from Arrangers.
- Arrangers will outline their syndication strategy and their view on the way the loan will price in market.
- Issuer gives the mandate to one or more Arrangers (Co-Arrangers)
- The arranger will prepare an information memo (IM) describing the terms of the transactions.
 - The IM typically will include:
 - Executive Summary
 - Investment Considerations
 - Summary of Terms and Conditions (Term Sheet)
 - Transaction Overview
 - Company
 - Management and Equity Sponsor Overview
 - Industry Overview
 - Financial Model
 - Timing for commitments, closing, as well as fees on level of commitments
- Bank meeting is scheduled at which potential lenders hear the management and the Investor group.

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- A deadline is given for the banks to send their commitment levels subject to final documentation
- Each Bank analyzes the deal's credit and assess the pricing (RORA). Each Issuer is assigned an internal rating.
- The Arranger collects all commitments – different amounts from each Bank
- Allocations are given and Legal Documentation is sent for their final review.
 - If the Deal is Oversubscribed, the allocation of each bank will most likely be reduced
 - If the Deal is undersubscribed, depending on the FLEX language, the pricing could be flexed up.
- After Review of Legal Documentation by each lender and signatures are sent, the Deal closes and funds.

Money Terms:

Amount, Rate, Maturity, Schedule Payment

Security:

Assets, Stock

Covenants:

Financial Covenants:

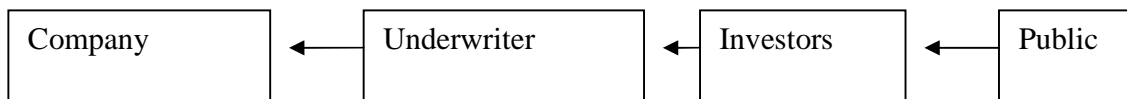
Negative Covenants: Asset Sale, New Debt, Equity,

Affirmative Covenants

Rating Agency:

Provide Ratings Sheet

Bond Issuance Process (Road Show) - Primary



File with SEC

Review by the SEC

Red Hearing

Rating Agencies - Presentations

Road Show – Presentations

Within a week – Priced

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Closed at a price (Common – weighted towards the bigger Investor)
(Note – Private Placement)

Equity Market - Process -Primary

Private Placement

Public (IPO)

SECONDARY MARKET

NYSE / NASDAQ / AMEX

Stock Prices Represent the Market Value of the Firm

(Stock Price * Outstanding=Equity Value) + Debt – Cash = Enterprise Value

Comparison = PE Multiples Concept / EBITDA Multiples

Comparison Vs Dow Jones trends Vs S&P 500

Beta Concept – Volatility

Lecture 5 –Bonds & Bond Analysis

Bond Prices, Yields and Portfolio Management (Chapters 10 & 11)

Money Terms:

- Amount
 - Face Value / Par Value (\$1,000)
 - Market Value quoted as a % of Face Value (priced at 98 or 98% of \$1,000)
- Coupon Payments / Coupon (Interest Rate)
 - ZERO COUPON PAYMENTS
 - Semi Annual Payments (interest payments)
 - Accrued Interest
 - $\text{Accr. Int.} = (\text{Annual Coupon} / 2) \times (\text{Days since last Coupon pmt} / \text{Days Separating Coupon Pmts})$

Example:

Par Value = \$1,000

Coupon = 4.25% therefore bond payment is \$42.50 per year in \$21.25 every 6 months

The Bid Price = 98:07 or 98 and 7/32 or 98.21875 % or MV = \$982.19

Bought it 32 days since the last coupon.

Accrued Interest pmt on the bond = $\$21.25 \times (32/182) = \7.47 .

The purchase price = $\$982.19 + \$3.73 = \$985.92$ (Invoice Price)

- Maturity / Call Provision
- Balloon Payment Characteristics

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- External Ratings

	S&P	Moody's
Risk Free	AAA	Aaa
INVESTMENT GRADE	AA+	Aa1
	AA	Aa2
	AA-	Aa3
	A+	A1
	A	A2
	A-	A3
	BBB+	Baa1
BBB	Baa2	
BBB-	Baa3	
NON-INVESTMENT GRADE	BB+	Ba1
	BB	Ba2
	BB-	Ba3
	B+	B1
	B	B2
B-	B3	
DISTRESS	CCC+	Caa1
	CCC	Caa2
	CCC-	Caa3
	CC	Ca
	C	C
Defaulted	D	C

NOTCHES

Types of Bonds:

- Treasury Bonds (10-30yr) & Notes (10 yr)
- Corporate Bonds
 - Call Provisions – Call Price / Call Protection
 - Convertible Bonds – option to convert to common stock
 - Conversion Ratio – number of shares for each bond

Example:

Bond Par Value = \$1,000

Convertible ratio = 40 shares

At Current Stock = \$20 per share so the option to convert is not profitable (\$20 x 40 = \$800 or *Market Conversion Value*)

At Current Stock = \$30 per share so the option to convert is profitable (\$30 x 40 = \$1,200 or *Market Conversion Value*)

- Conversion Premium is the excess of the bond price over its conversion value. If the bond were selling currently \$950, the stock is \$20 then its premium would be \$150 (\$950 – \$800)

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- Puttable Bonds (option to the bond holders to put the bonds to the Issuer)
- Floating-rate Bonds – T + 2.0%
- PIK Bonds (Paid-in-Kind)

- Preferred Stock (Dividends – Waterfall ahead of the Common Stock)
- Other Domestic Bonds (Municipal, local governments, Tax exempt)
- International Bonds
 - Foreign Bonds
 - Eurobonds (Issued in the currency of one country but sold in other national market) – Eurodollar – dollar-denominated bonds sold outside the U.S.
 - Yankee Bonds (foreign bonds sold in the US)
 - Samurai Bonds (Yen-denominated bonds sold in Japan by non-Japanese issuers)
 - Bulldog Bonds (British Pound-denominated foreign bonds sold in the U.K.)

Bond Pricing

Bond Value = PV of Coupons + PV of Par Value at Maturity

$$\text{Bond Value} = \sum (\text{Coupon Pmt} / (1 + r)^t) + (\text{Par Value} / (1 + r)^T)$$

Where,

Maturity Date = T – (using PV Factor tables)

Discount Rate = r

Years (t) – (using Annuity Factor tables)

Coupon x (1/r) [1 – (1 / ((1+r)^T))] + Par Value x (1 / ((1+r)^T))

or

Coupon x Annuity Factor (r, T) + Par Value x PV Factor (r, T)

Table:

Example

Par Value: \$1,000

Coupon: 8.0% (4% or \$40 coupon payment every six months)

Maturity: 30 years (60 payments)

$$\text{Price} = \sum [\$40 / (1.04)^t] + [1000 / (1.04)^{60}]$$

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$$\text{Price} = \$40 \times \text{Annual Factor} (4\%, 60) + \$1000 \times \text{PV Factor} (4\%, 60)$$

$$\text{Price} = \$ 904.94 + 95.06 = \$1,000$$

If the interest rates will rise to 10%

1	B	C	D	E	F	G	H
2	BOND PRICING						
3							
4	Par/Face Value	\$ 1,000.00		Semi-Annual Coupon =		4.00%	
5	Coupon % =	8.00%		Semi-Annual Payment =	\$	40.00	every 6 mnts
6	Maturity/Term =	30 yrs		Semi-Annual # Payments =		60	pmts
7							
8	Present Value of Coupon Pmts=			\$904.94	=PV(B4/2,G5,-G4)		
9	Present Value of Principal Pmt=			\$95.06	=PV(B4/2,G5,0,-B3,0)		
10	Total			<u>\$1,000.00</u>			

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11	11	B	C	D	E
12	Net Present Value		\$904.94	\$95.06	\$1,000.00
13			=NPV(\$B\$4/2,C16:C75)		
14		Long-Form			
15		Period	Coupon Payment	Principal Payment	Total Payment
16		0			\$ (1,000.00)
17		1	\$ 40.00	\$ -	\$ 40.00
18		2	\$ 40.00	\$ -	\$ 40.00
19		3	\$ 40.00	\$ -	\$ 40.00
20		4	\$ 40.00	\$ -	\$ 40.00
21		5	\$ 40.00	\$ -	\$ 40.00
22		6	\$ 40.00	\$ -	\$ 40.00
23		7	\$ 40.00	\$ -	\$ 40.00
24		8	\$ 40.00	\$ -	\$ 40.00
25		9	\$ 40.00	\$ -	\$ 40.00
26		10	\$ 40.00	\$ -	\$ 40.00
27		11	\$ 40.00	\$ -	\$ 40.00
28		12	\$ 40.00	\$ -	\$ 40.00
29		13	\$ 40.00	\$ -	\$ 40.00
30		14	\$ 40.00	\$ -	\$ 40.00
31		15	\$ 40.00	\$ -	\$ 40.00
32		16	\$ 40.00	\$ -	\$ 40.00
33		17	\$ 40.00	\$ -	\$ 40.00
34		18	\$ 40.00	\$ -	\$ 40.00
35		19	\$ 40.00	\$ -	\$ 40.00
36		20	\$ 40.00	\$ -	\$ 40.00
37		21	\$ 40.00	\$ -	\$ 40.00
38		22	\$ 40.00	\$ -	\$ 40.00
39		23	\$ 40.00	\$ -	\$ 40.00
40		24	\$ 40.00	\$ -	\$ 40.00
41		25	\$ 40.00	\$ -	\$ 40.00
42		26	\$ 40.00	\$ -	\$ 40.00
43		27	\$ 40.00	\$ -	\$ 40.00
44		28	\$ 40.00	\$ -	\$ 40.00
45		29	\$ 40.00	\$ -	\$ 40.00
46		30	\$ 40.00	\$ -	\$ 40.00
47		31	\$ 40.00	\$ -	\$ 40.00
48		32	\$ 40.00	\$ -	\$ 40.00
49		33	\$ 40.00	\$ -	\$ 40.00
50		34	\$ 40.00	\$ -	\$ 40.00
51		35	\$ 40.00	\$ -	\$ 40.00
52		36	\$ 40.00	\$ -	\$ 40.00
53		37	\$ 40.00	\$ -	\$ 40.00
54		38	\$ 40.00	\$ -	\$ 40.00
55		39	\$ 40.00	\$ -	\$ 40.00
56		40	\$ 40.00	\$ -	\$ 40.00
57		41	\$ 40.00	\$ -	\$ 40.00
58		42	\$ 40.00	\$ -	\$ 40.00
59		43	\$ 40.00	\$ -	\$ 40.00
60		44	\$ 40.00	\$ -	\$ 40.00
61		45	\$ 40.00	\$ -	\$ 40.00
62		46	\$ 40.00	\$ -	\$ 40.00
63		47	\$ 40.00	\$ -	\$ 40.00
64		48	\$ 40.00	\$ -	\$ 40.00
65		49	\$ 40.00	\$ -	\$ 40.00
66		50	\$ 40.00	\$ -	\$ 40.00
67		51	\$ 40.00	\$ -	\$ 40.00
68		52	\$ 40.00	\$ -	\$ 40.00
69		53	\$ 40.00	\$ -	\$ 40.00
70		54	\$ 40.00	\$ -	\$ 40.00
71		55	\$ 40.00	\$ -	\$ 40.00
72		56	\$ 40.00	\$ -	\$ 40.00
73		57	\$ 40.00	\$ -	\$ 40.00
74		58	\$ 40.00	\$ -	\$ 40.00
75		59	\$ 40.00	\$ -	\$ 40.00
76		60	\$ 40.00	\$ 1,000.00	\$ 1,040.00
77		IRR =			4.00%

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Valuing the Bonds

1	K	L	M	N	O	P
2	VALUING BONDS					
3						
4	Settlement Date=		1/15/2007			
5	Maturity Date=		1/15/2011			
6	Coupon Rate=		4.250%			
7	Yield to Maturity=		4.740%			
8	Redemption value %=		100			
9	Coupon Pmts per year=		2			
10						
11	Flat Price (% Par)		98.234	=PRICE(M4,M5,M6,M7,M8,M9)		
12	Day since last coupon=		0	=COUPDAYBS(M4,M5,2,1)		
13	Days in coupon period=		181	=COUPDAYS(M4,M5,2,1)		
14	Accrued Interest=		0	=(M12/M13)*M6*100/2		
15	Invoice Price=		98.234	=+M11+M14		
16						
17						
18	Settlement Date=		2/15/2007			
19	Maturity Date=		1/15/2011			
20	Coupon Rate=		4.250%			
21	Yield to Maturity=		4.740%			
22	Redemption value %=		100			
23	Coupon Pmts per year=		2			
24						
25	Flat Price (% Par)		98.264			
26	Day since last coupon=		31			
27	Days in coupon period=		181			
28	Accrued Interest=		0.36395028			
29	Invoice Price=		98.628			
30						

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Yield to Maturity

81	B	C	D	E	F	G	H
82	YIELD TO MATURITY						
83							
84	Settlement Date=		1/1/2000				
85	Maturity Date=		1/1/2010				
86	Coupon Rate=		8.000%				
87	Bond Pricing=		110				
88	Redemption Value=		100				
89	Coupon pmts per yr=		2				
90							
91	Yield to Maturity=		6.617%	=YIELD(D84,D85,D86,D87,D88,D89)			
92							

93	Long-Form			
94	Period	Coupon Payment	Principal Payment	Total Payment
95	0			\$ (1,100.00)
96	1	\$ 40.00	\$ -	\$ 40.00
97	2	\$ 40.00	\$ -	\$ 40.00
98	3	\$ 40.00	\$ -	\$ 40.00
99	4	\$ 40.00	\$ -	\$ 40.00
100	5	\$ 40.00	\$ -	\$ 40.00
101	6	\$ 40.00	\$ -	\$ 40.00
102	7	\$ 40.00	\$ -	\$ 40.00
103	8	\$ 40.00	\$ -	\$ 40.00
104	9	\$ 40.00	\$ -	\$ 40.00
105	10	\$ 40.00	\$ -	\$ 40.00
106	11	\$ 40.00	\$ -	\$ 40.00
107	12	\$ 40.00	\$ -	\$ 40.00
108	13	\$ 40.00	\$ -	\$ 40.00
109	14	\$ 40.00	\$ -	\$ 40.00
110	15	\$ 40.00	\$ -	\$ 40.00
111	16	\$ 40.00	\$ -	\$ 40.00
112	17	\$ 40.00	\$ -	\$ 40.00
113	18	\$ 40.00	\$ -	\$ 40.00
114	19	\$ 40.00	\$ -	\$ 40.00
115	20	\$ 40.00	\$ 1,000.00	\$ 1,040.00
116	IRR =			3.3085% 6.617%

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81	K	L	M	N	O	P	Q
82	YIELD TO CALL Vs YIELD TO MATURITY						
83							
84			YTC			YTM	
85	Settlement Date=		1/1/2000			1/1/2000	
86	Maturity Date=		1/1/2010			1/1/2030	
87	Coupon Rate=		8.00%			8.00%	
88	Coupon Pmt =	\$	40.00			\$ 40.00	
89	Number of semiannual		20 periods			60 periods	
90	Call Provision		110.00			1,000.00	
91	Final Payment		1,100.00			1,000.00	
92	Price		1,150.00			1,150.00	
93							
94	YIELD =		<u>6.6434%</u>			<u>6.8192%</u>	
95							
96							
97							

=YIELD(M85,M86,M87,M92/10,M91/10,2)

Bond Portfolio (Chapter 11)

Interest Rate Sensitivity – Calculating Duration and Convexity

$$D_{Mac} = \frac{\sum_{t=1}^N \frac{CF_t}{(1+i)^t} t}{V_B}$$

$$C = \frac{1}{(1+i)^2} \frac{\left[\sum_{t=1}^N \frac{CF_t}{(1+i)^t} (t^2 + t) \right]}{V_B}$$

Duration: is a measure of the sensitivity of the asset's price to [interest rate](#) movements. It broadly corresponds to the length of time before the asset is due to be repaid. This **duration** is equal to the ratio of the percentage reduction in the bond's price to the percentage increase in the [redemption yield](#) of the bond (or vice versa) (Lamda)

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The standard definition of duration is [Macaulay duration](#), the PV-weighted time to receive each cash flow, defined as:

$$\text{Weighted Average } Wt = [cf / (1 + y)^t] / \text{Bond Price}$$

Y = yield to maturity

T=time

$$D = \sum t \times Wt$$

100	K	L	M	N	O	P	Q
101	Duration						
102							
103	Int.Rate	10%					P x 0
104	=						
105		Time until	Payment	PV of Pmt	%	Duration	
106	8% coupon bond	1	80	72.727	7.65%	0.0765	
107		2	80	66.116	6.96%	0.1392	
108		3	1080	811.420	85.39%	2.5617	
109				950.263	100.00%	2.7774	
110							
111		Duration					
112							
113	Zero	will be 3 years					
114	Bond						
115							
116							

Duration is a key concept in bond portfolio management for at least 3 reasons:

1. It's a simple summary measure of the effective average maturity of the portfolio
2. It turns out to be an essential tool in immunizing portfolios from interest rate risk.
3. Duration is the measurement of the interest rate sensitivity of a bond portfolio.

Convexity

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convexity is a measure of the sensitivity of the [duration](#) of a [bond](#) to changes in [interest rates](#). There is an inverse relationship between convexity and sensitivity - in general, the higher the convexity, the less sensitive the bond price is to interest rate shifts, the lower the convexity, the more sensitive it is.

Duration is a [linear](#) measure or 1st derivative of how the price of a bond changes in response to interest rate changes. As interest rates change, the price is not likely to change linearly, but instead it would change over some curved [function](#) of interest rates. The more curved the price function of the bond is, the more inaccurate duration is as a measure of the interest rate sensitivity.

Convexity is a measure of the curvature or 2nd derivative of how the price of a bond varies with interest rate, i.e. how the duration of a bond changes as the interest rate changes.

$$\Delta P / P = - D \times \Delta y$$

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	K	L	M	N	O	P	Q	R	S	
101	MACAULAY DURATION AND CONVEXITY									
102	Sensitivity to interest rate movements							IRR=	10.0000%	
103			$=PV(M108/M109, M107 * M109, M106 * M105 / M109, M105)$						(\$820.74)	
104	Bond Price		\$875.38			If Yield Changes By	1.00%			
105	Face Value		1,000			Bond Price Will Change By	-54.63	-6.24%	=+R105/M104	
106	Coupon Rate		8.00%						$=-(M104 + PV((M108 + R104) / M109, M107 * M109, M106 * M105))$	
107	Life in Years		10			Modified Duration Predicts	-57.03		$=(-M112 * R104 * M104)$	
108	Yield		10.00%			Convexity Adjustment	2.47		$=0.5 * M113 * R104^2 * M104$	
109	Frequency		2			Total Predicted Change	-54.56		$=+R107 + R108$	
110										
111	Macaulay Duration		6.84	$=+P137/M104/M109$		Actual New Price	\$820.74		$=PV((M108 + Q104) / M109, M107 * M109, M106 * M105 / M109, M105)$	
112	Modified Duration		6.51	$=+M111 / (1 + M108 / M109)$		Predicted New Price	\$820.82		$=+M104 + R109$	
113	Convexity		56.49	$=+S137 / M104 / M109 * M109$		Difference	0.08		$=+R112 - R111$	

115	Period	Cash Flow	PV Cash		Duration Calc		Convexity		
			Flow	Weighted	Method 1	Method 2	PV of pv(CF)	Factor years	Calc
116	0	(\$875.38)							
117	1	40.00	38.10	4.352%	0.04352	38.10	34.554	2.000	69.11
118	2	40.00	36.28	4.145%	0.08289	72.56	32.908	6.000	197.45
119	3	40.00	34.55	3.947%	0.11842	103.66	31.341	12.000	376.09
120	4	40.00	32.91	3.759%	0.15037	131.63	29.849	20.000	596.97
121	5	40.00	31.34	3.580%	0.17901	156.71	28.427	30.000	852.82
122	6	40.00	29.85	3.410%	0.20459	179.09	27.074	42.000	1,137.09
123	7	40.00	28.43	3.247%	0.22732	198.99	25.784	56.000	1,443.92
124	8	40.00	27.07	3.093%	0.24742	216.59	24.557	72.000	1,768.07
125	9	40.00	25.78	2.946%	0.26510	232.06	23.387	90.000	2,104.85
126	10	40.00	24.56	2.805%	0.28052	245.57	22.273	110.000	2,450.08
127	11	40.00	23.39	2.672%	0.29388	257.26	21.213	132.000	2,800.10
128	12	40.00	22.27	2.544%	0.30533	267.28	20.203	156.000	3,151.62
129	13	40.00	21.21	2.423%	0.31503	275.77	19.241	182.000	3,501.80
130	14	40.00	20.20	2.308%	0.32310	282.84	18.324	210.000	3,848.14
131	15	40.00	19.24	2.198%	0.32970	288.61	17.452	240.000	4,188.45
132	16	40.00	18.32	2.093%	0.33493	293.19	16.621	272.000	4,520.86
133	17	40.00	17.45	1.994%	0.33892	296.68	15.829	306.000	4,843.78
134	18	40.00	16.62	1.899%	0.34177	299.17	15.076	342.000	5,155.85
135	19	40.00	15.83	1.808%	0.34357	300.76	14.358	380.000	5,455.92
136	20	1,040.00	391.97	44.777%	8.95533	7,839.30	355.524	420.000	149,320.02
137	Total		875.38	100%	13.68074 6.84037	11,975.81	793.99356		197,783.01

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Bond Terminology

Accrued Interest

Accrued interest is the interest that has been earned, but not yet been paid by the bond issuer, since the last coupon payment. Note that interest accrues equally on every day during the period. That is, it does not compound. So, halfway through the period, you will have accrued exactly one-half of the period's interest payment. It works the same way for any other fraction of a payment period.

Banker's Year

A banker's year is 12 months, each of which contains 30 days. Therefore, there are 360 (not 365) days in a banker's year. This is a convention that goes back to the days when "calculator" and "computer" were job descriptions instead of electronic devices. Using 360 days for a year made calculations easier to do. This convention is still used today in some calculations such as the Bank Discount Rate that is used for discount (money market) securities.

Bond

A bond is a debt instrument, usually tradable, that represents a debt owed by the issuer to the owner of the bond. Most commonly, bonds are promises to pay a fixed rate of interest for a number of years, and then to repay the principal on the maturity date. In the U.S. bonds typically pay interest every six months (semi-annually), though other payment frequencies are possible. Bonds are issued by corporations, banks, state and local governments (municipal bonds), and the federal government (Treasury Notes and Bonds).

Call Date

Some bonds have a provision in the indenture that allows for early, forced, redemption of the bond, often at a premium to its face value. Bonds that have such a feature usually have a series of such dates (typically once per year) at which they can be called. This series of dates is referred to as the call schedule.

Call Premium

The extra amount that is paid by a bond issuer if the bond is called before the maturity date. This is a sweetener that is used to make callable bonds attractive to investors, who would otherwise prefer to own non-callable bonds.

Clean Price

The "clean price" is the price of the bond excluding the accrued interest. This is also known as the quoted price.

Coupon Payment

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This is the actual dollar amount that is paid by the issuer to the bondholders at each coupon date. It is calculated by multiplying the [coupon rate](#) by the [face value](#) of the bond and then dividing by the number of payments per year.

Coupon Payment Date

The specified dates (typically two per year) on which interest payments are made.

Coupon Rate

The stated rate of interest on the bond. This is the annual interest rate that will be paid by the issuer to the owners of the bonds. This rate is typically fixed for the life of the bond, though variable rate bonds do exist. The term is derived from the fact that, in times past, bond certificates had coupons attached. The coupons were redeemed for cash payments.

Current Yield

A measure of the income provided by the bond. The current yield is simply the annual interest payment divided by the current market price of the bond. The current yield ignores the potential for capital gains or losses and is therefore not a complete measure of the bond's rate of return.

Day-count Basis

A method of counting the number of days between two dates. There are several methods, each of which makes different assumptions about how to count. **30/360** (a banker's year) assumes that each month has 30 days and that there are 360 days in a year. **Actual/360** counts the actual number of days, but assumes that there are 360 days in a year. **Actual/Actual** counts the actual number of days in each month, and the actual number of days in a year. In Excel bond functions, 0 signifies 30/360, 1 specifies actual/actual, 2 is actual/360, 3 is actual/365 (which ignores leap days), and 4 represents the European 30/360 methodology.

Dirty Price

The "dirty price" is the total price of the bond, including accrued interest. This is the amount that you would actually pay (or receive) if you purchase (or sell) the bond.

Face Value

The principal of a bond is the notional amount of the loan. It is also called the **principal** or **par** value of the bond, and represents the amount that will be repaid when the bond matures.

Indenture

The legal contract between a bond issuer and the bondholders. The indenture covers such things as the original term to maturity, the interest rate, interest payment dates, protective covenants, collateral pledged (if any), and so on.

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Maturity Date

The date on which the bond ceases to earn interest. On this date, the last interest payment will be made, and the face value of the bond will be repaid. This is also sometimes known as the **redemption date**.

Redemption Value

This is typically the same as the [face value](#) of a bond. However, for a callable bond, it is the face value plus the [call premium](#). In other words, this is the entire amount that will be received when the bond is redeemed by the issuer.

Settlement Date

The date on which ownership of a security actually changes hands. Typically, this is several days after the trade date. In the US markets, the settlement date is usually 3 trading days after the trade date (this is known as T+3). For bonds, a purchaser begins to accrue interest on the settlement date.

Term to Maturity

The amount of time until the bond stops paying interest and the principal is repaid.

Yield to Call

Same as yield to maturity, except that we assume that the bond will be called at the next call date. Also known as yield to first call. Frequently, the yield to all call dates is calculated, and then we can find the worst-case, which is known as the yield to worst.

Yield to Maturity

The yield to maturity (YTM) of a bond is the compound average annual expected rate of return if the bond is purchased at its current market price and held to maturity. Implicit in the calculation of the YTM is the assumption that the interest payments are reinvested for the life of the bond at the same yield. The YTM is the [internal rate of return](#) (IRR) of the bond.

Yield to Worst

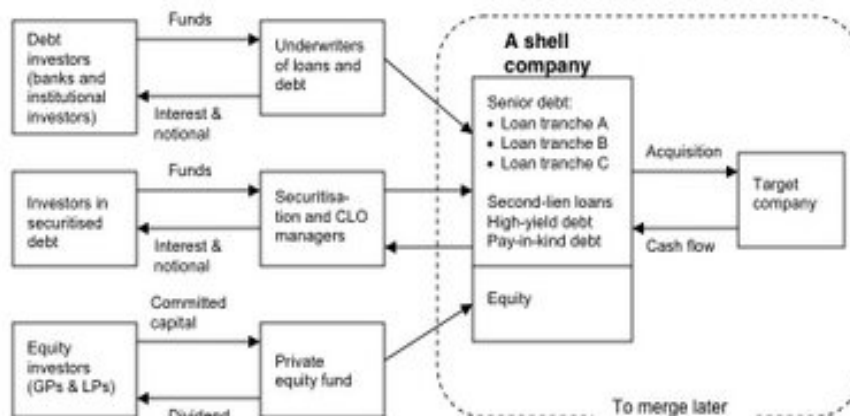
The lowest of all possible yields for the bond. It is calculated by determining the minimum of the [yield to maturity](#) or any of the various [yields to call](#) date

Lecture 6 – LBO & Equity Analysis

- A leveraged buyout (or LBO, or highly leveraged transaction (HLT)) occurs when an investor, typically a financial sponsor acquires a controlling interest in a company's equity and where a significant percentage of the purchase price is financed through leverage (Debt).
- The Debt raised (by issuing bonds or securing a loan) is ultimately secured upon the acquisition target and also looks to the cash flows of the acquisition target to make interest and principal payments.
- Acquisition debt in an LBO is usually non-recourse to the financial sponsor and to the equity fund that the financial sponsor manages.
- The amount of debt used to finance a transaction as a percentage of the purchase price for a leverage buyout target, varies according to the financial condition and history of the acquisition target, market conditions, the willingness of lenders to extend credit. Typically the debt portion of a LBO ranges from 50%-85% of the purchase price, but in some cases debt may represent upwards of 95% of purchase price.
- To finance LBO's, private-equity firms usually issue some combination of syndicated loans and high yield bonds.

Graph 3.1

Typical structure of a LBO transaction



LBO History & Market Evolution

- The first leveraged buyout may have been the purchase of two companies: Pan-Atlantic and Waterman companies (steamship companies) in 1955 by McLean Industries.
 - McLean borrowed \$42 million and raised an additional \$7 million through an issue of preferred stock.
 - When the deal closed, \$20 million of Waterman cash and assets were used to retire \$20 million of the loan debt.
 - The Debt raised (by issuing bonds or securing a loan) is ultimately secured upon the acquisition target and also looks to the cash flows of the acquisition target to make interest and principal payments.

- The use of publicly traded holding companies as investment vehicles to acquire portfolios of investments in corporate assets was a relatively new trend in the 1960s, popularized by the likes of Warren Buffett via Berkshire Hathaway and Victor Posner via DWG Corporation.

- The leveraged buyout boom of the 1980s was conceived by a number of corporate financiers, most notably Jerome Kohlberg, Jr. and later his protégé Henry Kravis and his cousin George Roberts – both working for Bear Stearns – to create KKR.

- In 1989, KKR closed in on a \$31.1 billion dollar takeover of RJR Nabisco. It was, at that time and for over 17 years, the largest leverage buyout in history. The event was chronicled in the book (and later the movie), *Barbarians at the Gate: The Fall of RJR Nabisco*.

- Drexel Burnham Lambert was the investment bank most responsible for the boom in private equity during the 1980s due to its leadership in the issuance of high-yield debt.

- Mega Deals of 2005-2007: The combination of decreasing interest rates, loosening lending standards, creation of CLOs and regulatory changes for publicly traded companies (specifically the Sarbanes-Oxley Act.) would set the stage for the largest boom private equity had seen.

Leveraged Buyouts – Enhancing Equity Returns



Your Business

Income Statement		Balance Sheet	
EBIT:	\$1.5 million	ASSETS:	LIABILITIES:
Interest Exp.:	\$ 0 million		\$0 (No Debt)
Pretax Income:	\$1.5 million	\$10 million	EQUITY:
Taxes (33%):	\$0.5 million		\$10 million
Net Income:	\$1.0 million		

} ROA = 10%
ROE = 10%

The offer: \$10mm (10 x Net Income) borrowed \$9 million (90%) at 10%

LBO: NewCo


Income Statement		Balance Sheet	
EBIT:	\$1.5 million	ASSETS:	LIABILITIES:
Interest Exp.:	\$0.9 million		\$9 million 
Pretax Income:	\$ 0.6 million	\$10 million	EQUITY:
Taxes (33%):	\$0.2 million		\$1 million
Net Income:	\$ 0.4 million		

} ROA = 10%
ROE = 40%

5

Leveraged Buyouts – Enhancing Equity Returns

Your Business


Income Statement		Balance Sheet	
EBIT:	\$1.5 million	ASSETS:	LIABILITIES:
Interest Exp.:	\$ 0 million		\$0 (No Debt)
Pretax Income:	\$1.5 million	\$10 million	EQUITY:
Taxes (33%):	\$0.5 million		\$10 million
Net Income:	\$1.0 million		

} ROA = 10%
ROE = 10%

20% Premium

The offer: \$12 mm (12 x Net Income) borrowed \$10.8 million (90%) at 10%

LBO: NewCo

Income Statement		Balance Sheet	
EBIT:	\$1.50 million	ASSETS:	LIABILITIES:
Interest Exp.:	\$1.08 million	Purchase: \$10 million	\$10.8 million 
Pretax Income:	\$ 0.42 million	Goodwill: \$ 2 million	EQUITY:
Taxes (33%):	\$0.14 million	Total: \$12 million	\$ 1.2 million
Net Income:	\$ 0.28 million		

} ROA = 10% (tang)
ROE = 23%

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Senior Debt (Bank Loan or Leverage Loan)

- Ranks ahead of all other debt and equity capital in the business
- Bank loans are typically structured in up to three tranches: Revolver, TL A and TL B.
- The debt is usually secured on specific assets of the company, which means the lender can automatically acquire these assets if the company breaches its obligations under the relevant loan agreement; therefore it has the lowest cost of debt.
- Typical Maturity 5-7 years
- Senior Debt represent 45-60% of total Capital
- Senior Debt Multiples represent 3.0x – 4.0x of historic EBITDA
- Revolver and TL A (called Pro-rata facilities) are provided by traditional banks
- Term Loan B (called institutional facility) is provided by non-banking institutions (CLOs, Insurance Co., Funds)

Pros

- ✓ Usually offers the lowest cost of funding
- ✓ Prepayable at no or little cost
- ✓ Deep established market in the U.S which can accommodate large transactions
- ✓ Private market and therefore less exposed to volatile market conditions
- ✓ No equity dilution

Cons

- ✓ Requires periodic amortization out of free cash flows, therefore this instrument may not be suitable for companies consuming cash for some years
- ✓ Strict maintenance covenants are tightly monitored, usually on a quarterly basis (eg total leverage, interest cover, fixed charge cover ratio, etc)
- ✓ Full security required in most cases

Subordinated Debt (Mezzanine)

- Ranks behind senior debt in order of priority on any liquidation.
- The terms of the subordinated debt are usually less stringent than senior debt.
- Repayment is usually required in one 'bullet' payment at the end of the term.
- Typical maturity is 8-10 years
- Since subordinated debt gives the lender less security than senior debt, lending costs are typically higher.
- An increasingly important form of subordinated debt is the high yield bond, often listed on US markets.
- They are fixed rate, publicly traded, long-term securities with a looser covenant package than senior debt though they are subject to stringent reporting requirements.
- High yield bonds are not prepayable for the first five years and after that, they are prepayable at a premium (Call premiums)
- SEC requires the Issuer of these bonds to be rated by two independent agencies (Moody's and S&P)
- Subordinated Debt represent 15-25% of total Capital
- Total Debt (including both the Senior and Sub debt represent 5.0x – 6.0x of historic EBITDA.

Private Equity

- Ranks at the bottom of the "waterfall" in order of priority on any liquidation.
- Equity represent 20-35% of total Capital

Estimate Debt Capacity

- The next step is to estimate the amount of debt that the company can take on.
- The financial statements should make provisions for interest and debt costs.
- The company can only bear debt to the extent that it has available cash flows. Note that all existing debt will need to be refinanced. When modelling (Equity or Debt investors) the financing assumptions used are according to market conditions, industry characteristic and company specific issues. Set out below are some parameters that will influence financing considerations for the model:
 - Minimum interest cover (times)
 - Total debt/EBITDA (times)
 - Senior debt repayment (in years)
 - Mezzanine debt repayment (in years)
 - Senior debt interest rate
 - Subordinated interest rate
 - Mezzanine finance exit IRR

Capital Markets: Types of Financing

Example:

XYZ Company trades at NYSE at \$15 with 20 million shares and has \$300 million of Debt, \$100 of Cash and \$100 mm of EBITDA, so

Trading Enterprise Value (EV) = (Equity at \$15 x 40 million shares) + \$300 mm Debt – \$ 100 mm Cash = \$800 mm or 8.0x EBITDA trading multiple (EV / EBITDA)

The PE firm are in the process of tendering for all the shares of XYZ. To ensure a success of acquiring all the shares, they thinking of offering 33% premium to the existing trading level stock, or tendering for the stock at \$20 per share putting he EV at \$1 billion - (\$20 x 40 mm shares) + \$300 mm Debt - \$100mm Cash = \$1 billion

Transaction Sources & Uses

Sources				Uses	
	Capacity	Amount	% Cap		
Senior Debt	4.0x	\$ 400.00	40.0%	Purchase of Stock	800.0
Subordinated Debt	6.0x	\$ 200.00	20.0%	Refinance of Debt	300.0
Equity		<u>\$ 400.00</u>	<u>40.0%</u>	Cash	<u>(100.0)</u>
Total Sources	10.0x	<u>1,000.0</u>	<u>100.0%</u>	Total Uses	<u>1,000.0</u>
EBITDA		\$ 100.00 mm			

The PE firm will need to run their own LBO Analysis to see if \$1 billion acquisition makes sense given the Debt Capacity and improvement of EBITDA in the next 3-5 years.

Senior Debt / Loan Pricing

Other Terminology to the Credit Agreement

- LIBOR Floor
- Original Issuer Discount (OID)
- Margin Spread

A typical calculation of Loan Yields in the secondary market for loans:

LIBOR or LIBOR Floor + Margin Spread + (100-OID)/4* years = Loan Yield

*market convention is to use 4 years as it represents the average life

Example:

LIBOR Floor = 1.00%
Margin Spread = 400 basis points (or 4.00%)
OID = 98

Then the Loan Yield is calculated to:

1.0% + 4.0% + [(100 - 98)/100]/4 = 5.0% + (2.0% / 4) = 5.0% + 0.5% = 5.5% Yield

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High Yield Bond Pricing

Concepts:

- Face Value / Par Value (\$1,000)
 - Market Value quoted as a % of Face Value (priced at 98 or 98% of \$1,000)
- Coupon Payments / Coupon (Interest Rate)
 - Semi Annual Payments (interest payments)
 - Callable / Non-Callable Bonds
 - YTM, YTC, YTW

Yield to Maturity Vs Yield to Call

BV= 1,000.00 100 Face Value
 MV= 860.00 85 Price
 Coupon= 8%
 n= 10 years

Year	Call Price	YTC/YTM	0	1	2	3	4	5	6	7	8	9	10
Year 1=	105	32.9%	(850.00)	1,130.00									
Year 2=	104	19.6%	(850.00)	80.00	1,120.00								
Year 3=	103	15.5%	(850.00)	80.00	80.00	1,110.00							
Year 4=	102	13.5%	(850.00)	80.00	80.00	80.00	1,100.00						
Year 5=	101	12.4%	(850.00)	80.00	80.00	80.00	80.00	1,090.00					
Year 6-10=	100	10.5%	(850.00)	80.00	80.00	80.00	80.00	80.00	80.00	80.00	80.00	80.00	1,080.00

Other Bond Concepts:

- Duration & Convexity
 - Convertible Bonds
 -

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SEE UPDATED SPREADSHEET ON LINE

Equity IRR Analysis

Starwood Hotel & Resort ('HOT')

Public to Private LBO Equity Analysis using CAPM

TRANSACTION SOURCES & USES

Sources:	Debt Capacity (EBITDA x)	Amount (\$ 000's)	% Capital	Expected Return	Expected Return (After Tax)	WACC (After Tax)	EBITDA Multiple
Bank Loan	3.5x	4,032,000	26.9%	4.896%	3.134%	0.84%	3.9x
Mezzanine Note		2,880,000	19.2%	7.000%	4.480%	0.86%	2.8x
Total Debt	6.0x	6,912,000	46.2%			1.71%	6.7x
Equity	7.0x	8,064,000	53.8%	17.78%	17.78%	9.57%	7.8x
Total Sources	13.0x	14,976,000	100.0%			11.25%	14.5x

Uses:	Current Stock Price	Stock Price Bid	1st Year's EBITDA Multiple	Amount (\$ 000's)	% of Total Uses	Shares Outstanding (mm)
Stock Purchase	\$ 53.10	\$ 57.30		11,326,000	73.4%	197.65
Refinance Debt				3,650,000	23.7%	
Enterprise Value			13.0x	14,976,000	97.1%	
Transaction Fees & Expenses			Premium= 7.9%	449,280	2.9%	
Total Uses			3.0%	15,425,280	100.0%	

WACC = 3.695%
Tax Rate = 36.0%

COST OF BANK DEBT CALCULATION (Floaring Rate)			Equity Risk Premiums (1926-2006) (CAPM Model)		
3M-LIBOR Assumptions	Loan Spread	Initial All-In	Decile	Mkt Cap \$MM	Risk Prem.
0.30%	3.50%	3.80%	1	524,351	7.03%
COST OF MEZZANINE NOTE CALCULATION			2	10,344	8.05%
7.00%			3	4,144	8.47%
			4	2,177	8.75%
COST OF EQUITY CALCULATION			5	1,328	9.03%
E (re) = rf + β . Pe + e			6	840	9.18%
6-year Treasury Note [rf]	1.20%		7	538	9.58%
Beta for Publicly Traded Hotel [β]	1.500x		8	333	9.91%
Equity Premium [Pe]	11.05%		9	193	10.43%
Firm Specific Risk Premium [e]	0.0%		10	85	11.05%
Cost of Equity	17.78%				

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Equity IRR Analysis

DEBT ASSUMPTIONS & RETURN ANALYSIS

Bank Loan Information	Debt IRR	Terms	2012	2013	2014	2015	2016	2017
Amount Outstanding (End of Year)		4,032,000	4,032,000	3,830,400	3,427,200	2,822,400	2,016,000	1,209,600
Schedule Principal Payments		7 years	-	201,600	403,200	604,800	806,400	806,400
Interest Payment (Calc based on last Year's Outs)		4.90%	153,216	173,376	183,859	193,778	163,699	116,928
Total Financing Payment	4.896%		(14,032,000)	153,216	374,976	587,059	803,578	970,059
Interest Rate			3.80%	4.30%	4.80%	5.60%	5.80%	5.80%
LIBOR RATE			0.30%	0.80%	1.30%	2.30%	2.30%	2.30%
LIBOR Rate Increase Assumptions			0.00%	0.50%	0.50%	1.00%	0.00%	0.00%
Corporate Bond Information								
Amount Outstanding		2,880,000	2,880,000	2,880,000	2,880,000	2,880,000	2,880,000	2,880,000
Schedule Principal Payments		10 Years	-	-	-	-	-	-
Interest Payment (Calc based on last Year's Outs)		7.00%	201,600	201,600	201,600	201,600	201,600	201,600
Total Financing Payment	7.000%		(2,880,000)	201,600	201,600	201,600	201,600	201,600
Total Financing			354,816	576,576	788,659	1,005,178	1,171,699	1,124,928
Total Debt Outstanding			6,912,000	6,710,400	6,307,200	5,702,400	4,896,000	4,089,600

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Equity IRR Analysis

CASH FLOW & EQUITY RETURN ANALYSIS								
Company Projections	Operating Assump.	Entry Year 2011	Year 1 2012	Year 2 2013	Year 3 2014	Year 4 2015	Year 5 2016	Exit Year 2017
Revenues	7.00%	5,624,000	6,017,680	6,438,918	6,889,642	7,371,917	7,887,951	8,440,107
Cost of Revenues (Incl. Depreciation)	35.0%	(1,970,000)	(2,107,900)	(2,255,453)	(2,413,335)	(2,582,268)	(2,763,027)	(2,956,439)
Operating Costs	47.8%	(2,691,000)	(2,879,370)	(3,080,926)	(3,296,591)	(3,527,352)	(3,774,267)	(4,038,465)
EBIT	17.1%	963,000	1,030,410	1,102,539	1,179,716	1,262,297	1,350,657	1,445,203
Less Amortization of Fees	7		(64,183)	(64,183)	(64,183)	(64,183)	(64,183)	(64,183)
EBIT			966,227	1,038,356	1,115,534	1,198,114	1,286,474	1,381,020
Less Interest (Unlevered for DCF Analysis)			(354,816)	(374,976)	(385,459)	(400,378)	(365,299)	(318,528)
EBT			611,411	1,413,332	1,500,993	1,598,491	1,651,774	1,699,548
Less Taxes (adj out Interest Exp)	36.0%		(220,108)	(508,799)	(540,357)	(575,457)	(594,639)	(611,837)
Plus Interest			354,816	374,976	385,459	400,378	365,299	318,528
Plus Depreciation	3.4%	189,000	202,230	216,386	231,533	247,740	265,082	283,638
Plus Amortization			64,183	64,183	64,183	64,183	64,183	64,183
Less Working Capital	0.00%		-	-	-	-	-	-
Less Capex	6.85%	(385,000)	(411,950)	(440,787)	(471,642)	(504,656)	(539,982)	(577,781)
Cash Flow Before Financing (CFBF)			600,382	1,119,291	1,170,169	1,230,679	1,211,717	1,176,279
Less Financing (P + I)			(354,816)	(576,576)	(788,659)	(1,005,178)	(1,171,699)	(1,124,928)
Equity Cash Flows			245,766	542,715	381,510	225,501	40,018	51,351
EBITDA		1,152,000	1,232,640	1,318,925	1,411,250	1,510,037	1,615,740	1,728,841
Terminal Value								
EBITDA Multiple Method (initial purchase multiple)	Growth	13.0x						22,474,938
Perpetuity Method (using WACC + growth)	3.50%	11.28%						14,410,675
Average Terminal Value								18,442,806
Debt Outstanding								4,089,600
Equity Value (TV - Debt)								14,353,206
Equity Cash Flows		(8,064,000)	245,766	542,715	381,510	225,501	40,018	14,404,557
\$ 1 PV Table (Expected Equity Rate)	17.78%		x	x	x	x	x	x
PV Table (Expected Equity Rate)		6,365,686	208,674	391,260	233,532	117,202	17,660	5,397,358
Initial Investment		(8,064,000)						
NPV=		(1,698,314)						
IRR=		12.8%						

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Lecture 7 – Structured Finance (CDO, CLO, MBS, ABL, ABS)

There are several main types of structured finance instruments.

- Asset-backed securities (ABS) are bonds or notes based on pools of assets, or collateralized by the cash flows from a specified pool of underlying assets.
- Mortgage-backed securities (MBS) are asset-backed securities the cash flows of which are backed by the principal and interest payments of a set of mortgage loans.
 - Residential Mortgage-Backed Securities, (RMBS) deal with Residential homes, usually single family.
 - Commercial Mortgage-Backed Securities (CMBS) are for Commercial Real Estate such as malls or office complexes.
 - Collateralized mortgage obligations (CMOs) are securitizations of mortgage-backed securities.
- Collateralized debt obligations (CDOs) consolidate a group of fixed income assets such as high-yield debt or asset-backed securities into a pool, which is then divided into various tranches.
 - Collateralized bond obligations (CBOs) are CDOs backed primarily by corporate bonds.
 - Collateralized loan obligations (CLOs) are CDOs backed primarily by leveraged bank loans.
 - Commercial real estate collateralized debt obligations (CRE CDOs) are CDOs backed primarily by commercial real estate loans and bonds.

Collateral Analysis

Collateral is assets provided to secure an obligation. Traditionally, banks might require corporate borrowers to commit company assets as security for loans. Today, this practice is called **secured lending** or **asset-based lending**. Collateral can take many forms: property, inventory, equipment, receivables, oil reserves, etc.

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	Advance Rates (ABL Facility)	BV of Assets (\$ mm)	Debt Capacity based on Collateral
Cash	100%	50.00	50.00
A/R	85%	200.00	170.00
Inventory	50%	150.00	75.00
Fixed Assets	50%	300.00	150.00
Investments	50%	100.00	50.00
Total		800.00	495.00

A more recent development is **collateralization arrangements** used to secure [repo](#), [securities lending](#) and [derivatives](#) transactions. Under such arrangement, a party who owes an obligation to another party posts collateral—typically consisting of cash or [securities](#)—to secure the obligation. In the event that the party defaults on the obligation, the secured party may seize the collateral. In this context, collateral is sometimes called **margin**.

An arrangement can be unilateral with just one party posting collateral. With two-sided obligations, such as a [swap](#) or foreign exchange [forward](#), bilateral collateralization may be used. In that situation, both parties may post collateral for the value of their total obligation to the other. Alternatively, the net obligation may be collateralized—at any point in time, the party who is the net obligator posts collateral for the value of the net obligation.

In a typical collateral arrangement, the secured obligation is periodically marked-to-market, and the collateral is adjusted to reflect changes in value. The securing party posts additional collateral when the [market value](#) has risen, or removes collateral when it has fallen. The collateral agreement should specify:

- **Acceptable collateral:** A secured party will usually prefer to receive highly rated collateral such as Treasuries or agencies. Collateral whose market value is volatile or negatively correlated with the value of the secured obligation is generally undesirable.
- **Frequency of margin calls:** Because the value of an obligation and the value of posted collateral can change, a secured party typically wants to mark-to-market frequently, issuing a margin call to the securing party for additional collateral when needed.
- **Haircuts:** In determining the amount of collateral that must be posted, haircuts are applied to the market value of various types of collateral. For example, if a 1% haircut is

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applied to Treasuries, then Treasuries are valued at 99% of their market value. A 5% haircut might be applied to certain corporate bonds, etc.

- **Threshold level:** Only the value of an obligation above a certain threshold level may be collateralized. For example, if a USD 1MM threshold applies to a USD 5MM obligation, only USD 4MM of the obligation will actually be collateralized.
- **Close-out and termination clauses:** The parties must agree under what circumstances the obligation will be terminated. The form of a final settlement in the event of such termination and the role of the collateral in such settlement is specified.
- **Valuation:** A methodology for marking both the obligation and the collateral to market must be agreed upon.
- **Rehypothecation rights:** The secured party may wish to have use of posted collateral possibly lending it to another party or posting it as collateral for its own obligations to another party. Rehypothecation is not permitted in many jurisdictions.

Legal treatment of collateral varies from one jurisdiction to another. In some jurisdictions, the secured party takes legal possession of collateral, but is legally bound by how the collateral may be used and the conditions upon which it must be returned. Such transfer of title provides the secured party a high degree of assurance that it may seize the collateral in the event of a default. Transfer of title, however, may be treated as a taxable event in some jurisdictions. In other jurisdictions, the securing party retains ownership of collateral, but the secured party acquires a [perfected](#) interest in it.

Portfolio Credit Risk – Technical Analysis:

Credit assessment - institutions manage credit risk, calculate economic and regulatory capital, and manage their balance sheets more effectively. Major components of an internal rating system, includes tools and methodologies for the analysis of probability of default, loss given default, and exposure at default.

Loss Given Default or **LGD** is a common parameter in Risk Models and also a parameter used in the calculation of [Economic Capital](#) or [Regulatory Capital](#) under [Basel II](#) for a banking institution. This is an attribute of any exposure on bank's client. Exposure is the amount that one may lose in an investment.

$\text{LGD} = \text{Default} * (1 - \text{Recovery})$

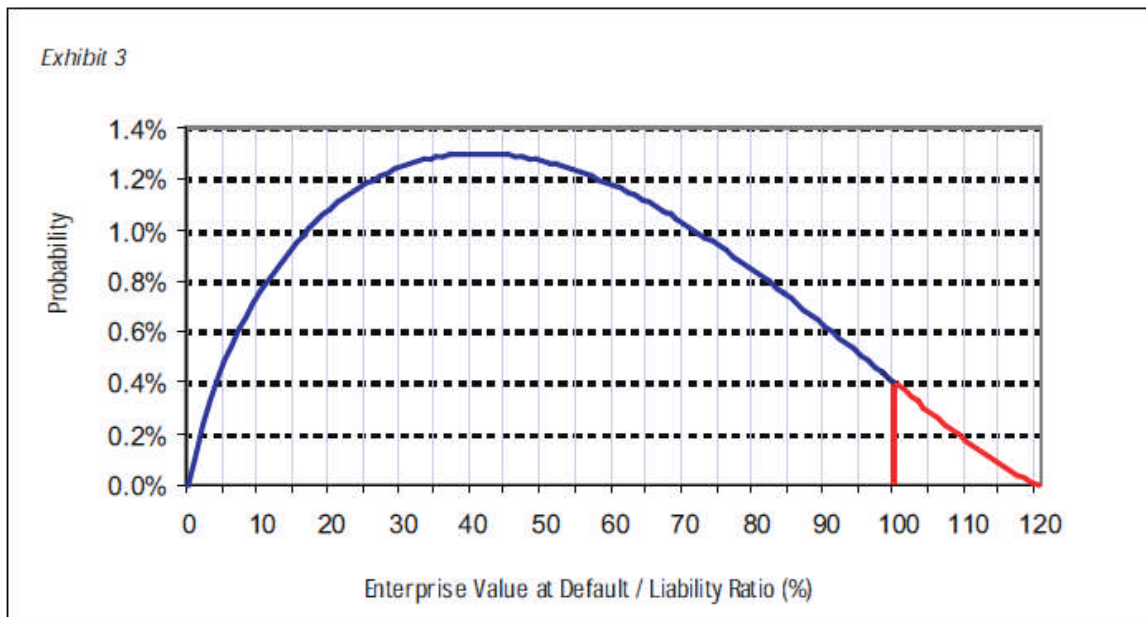
Basel Accord: The New Basel Accord, expected to be implemented at year-end 2006, will require

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internationally active banks to use more risk sensitive methods for calculating credit risk capital requirements

Default measure is derived from an annualized expected default rate. By definition, a debt instrument can experience a loss only if there has been a default. However, there is no standard definition of what constitutes a default. Different definitions may be used for different purposes. Typically a default occurs when any of the following conditions are met:



- A loan is placed on non-accrual
- A charge-off has already occurred
- The obligor is more than 90 days past due
- The obligor has filed bankruptcy

The BIS reference definition of default for purposes of the New Basel Accord reflects many of these events:

“A default is considered to have occurred with regard to a particular obligor when one or more of the following events has taken place.

- (a) It is determined that the obligor is unlikely to pay its debt obligations (principal, interest, or fees) in full;
- (b) A credit loss event associated with any obligation of the obligor, such as charge-off,

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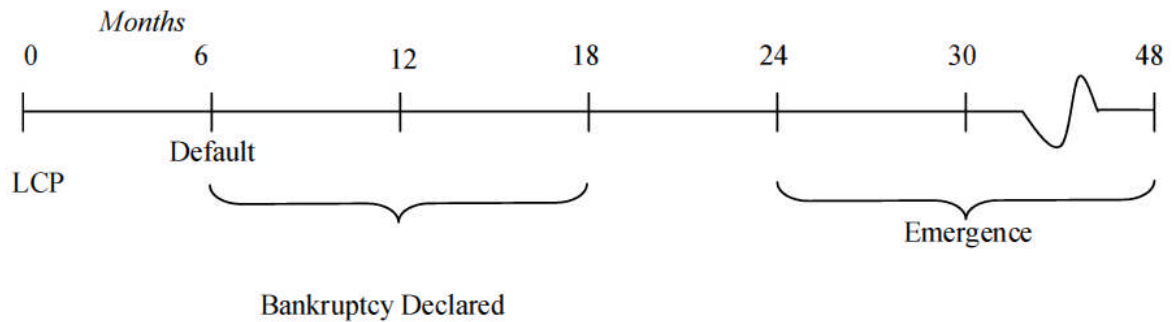
specific provision, or distressed restructuring involving the forgiveness or postponement of

principal, interest, or fees;

(c) The obligor is past due more than 90 days on any credit obligation; or

(d) The obligor has filed for bankruptcy or similar protection from creditors.”

Timeline of a distress firm:



A firm in distress typically goes through four stages as is illustrated in the timeline above.

1. **LCP**: the last cash paid date is known only ex post but serves as an anchor to the chronology.

2. **Default** is considered to occur at some later point, for bonds typically six months later.

Default

is often defined when a coupon or interest payment is missed. The six month delay between

last cash paid and default results from coupons on bonds typically being paid twice yearly.

3. **Bankruptcy** (usually Chapter 11) is declared anywhere from the time of default to about a year

later. A firm can default on debt obligations and still not declare bankruptcy depending on the

negotiations with its creditors.

4. **Emergence** from bankruptcy proceedings, either via liquidation or genuine emergence as a

going concern, typically occurs anywhere from two to four years after the last cash paid.

Cash flows from distressed instruments may occur throughout this process, although the bulk

comes during or immediately after emergence when restructuring plans and additional financing

(e.g. debtor-in-possession lending) are in place.

The time spent in bankruptcy can dramatically reduce the value of debt recovery. The

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average time spent in bankruptcy is around two years (Helwege (1999), Eberhart, Altman and

Aggarwal (1998), Gupton, Gates and Carty (2000), Garbade (2001)) which is reflected in our

timeline. Bond-only studies indicate that the average time in bankruptcy is a bit longer, more like

2½ years (Wagner (1996), Eberhart and Sweeny (1992)). Helwege (1999) finds that the presence

of contingent claims (e.g. unfunded pension liabilities) and size (a proxy for complexity) tend to

lengthen bankruptcy proceedings.

Altman's Z-SCORE

Z Formula

$$Z = 1.2x(WC/TA) + 1.4x(RE/TA) + 3.3x(EBIT/TA) + 0.6x(MVE/Liabilities) + 0.99x(Sales/TA)$$

WC = Working Capital

TA=Total Assets

RE=Retained Earnings

MVE=Market Value of Equity

<u>Z-Score</u>	<u>Bankruptcy</u>
1.8x or less	Likely
Between 1.8 - 3.0	Uncertain
3.0 or above	Not likely

Recovery

Historical 70% Corporate Loans, 45% for Bonds

Volatility measure is derived from the standard deviation of that expected default rate.

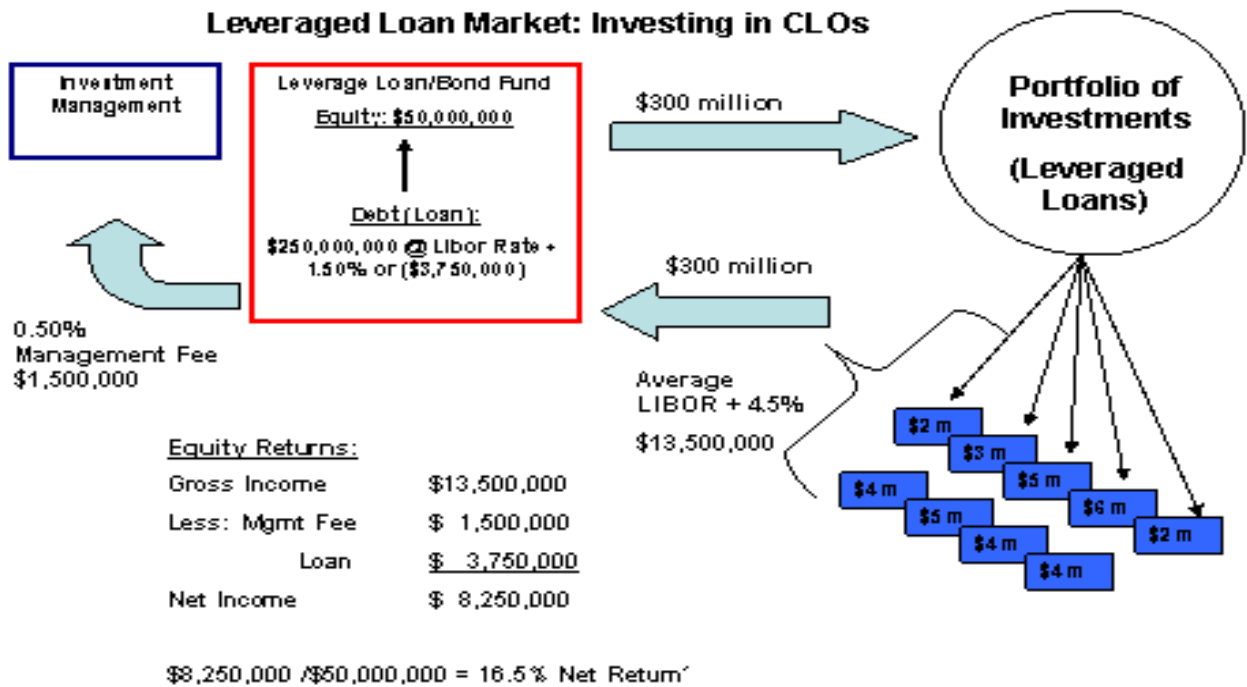
Correlation measure is a ratio of this standard deviation with and without the correlation coefficient factored in.

RAROC (Return Adjusted Risk of Capital):

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CLO STRUCTURE



* Non adjusted for defaults – Assuming 3% default with 70% Recovery, IRRs are estimated at 11.1%

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Arbitrage Cash Flow CLO Model

Capital Structure

Tranche	Par amount	% Cap	% Debt	Rating S&P/M	Discount margin Libor+	Coupon	Price	WACD Libor +
A	429.0	64.4%	71.2%	AAA/Aaa	120	L+120	99.7695	85.41
B	61.8	9.3%	10.2%	AA/Aa2	185	L+185	97.3653	18.95
C	53.5	8.0%	8.9%	A/A2	285	L+285	94.8608	25.30
D	32.5	4.9%	5.4%	BBB/Baa2	375	L+375	90.0358	20.22
E	26.0	3.9%	4.3%	BB/Ba2	420	L+420	93.9848	18.12
Total Debt	602.8	90.5%	100.0%					
Equity	63.5	9.5%		NR				
	<u>666.3</u>	<u>100.0%</u>						<u>168.0</u>

Portfolio of Leveraged Loans

	Par amount	% Cap	Rating S&P	Discount margin Libor+	Annual Income L+	WAI
Company 1	21.0	3.2%	B+	350	735,000	11.03
Company 2	35.0	5.3%	B-	500	1,750,000	26.27
Company 3	25.0	3.8%	B	450	1,125,000	16.89
Company 4	22.0	3.3%	B+	375	825,000	12.38
Company 5	30.0	4.5%	B+	375	1,125,000	16.89
Company 6	15.0	2.3%	BB-	325	487,500	7.32
Company 7	15.0	2.3%	B+	375	562,500	8.44
Company 8	25.0	3.8%	B	425	1,062,500	15.95
Company 9	19.3	2.9%	B-	550	1,058,750	15.89
Company 10	25.0	3.8%	CCC	750	1,875,000	28.14
Company 11	30.0	4.5%	B+	375	1,125,000	16.89
Company 12	25.0	3.8%	B-	600	1,500,000	22.51
Company 13	30.0	4.5%	B	475	1,425,000	21.39
Company 14	15.0	2.3%	B+	425	637,500	9.57
Company 15	30.0	4.5%	B+	350	1,050,000	15.76
Company 16	32.0	4.8%	BB	300	960,000	14.41
Company 17	27.0	4.1%	B+	375	1,012,500	15.20
Company 18	30.0	4.5%	B-	500	1,500,000	22.51
Company 19	28.0	4.2%	B-	501	1,402,800	21.06
Company 20	35.0	5.3%	B-	502	1,757,000	26.37
Company 21	30.0	4.5%	B-	503	1,509,000	22.65
Company 22	25.0	3.8%	B-	504	1,260,000	18.91
Company 23	30.0	4.5%	B-	505	1,515,000	22.74
Company 24	32.0	4.8%	B-	506	1,619,200	24.30
Company 25	35.0	5.3%	B-	507	1,774,500	26.63
	<u>666.3</u>	<u>100.0%</u>			<u>30,653,750</u>	<u>460.09</u>

	Par amount	Margin	Annual Debt Svc
A	429.0	120.00	5,148,000
B	61.8	185.00	1,142,375
C	53.5	285.00	1,524,750
D	32.5	375.00	1,218,750
E	26.0	420.00	1,092,000
			<u>10,125,875</u>

Equity CF	20,527,875
ROE	32.3%

BASE CASE

Default Rate	3.00%
Recovery	70.00%
LGD rate	0.900%
LGD	<u>5,996,250</u>

RAROC	14,531,625
RAROC %	22.88%